Nitrate and Nitrite

Owners of private wells are responsible for ensuring that their water is safe from contaminants. The presence of contaminants in water can lead to health issues, including gastrointestinal illness, reproductive problems, and neurological disorders.

What are nitrate and nitrite?
Nitrate and nitrite are compounds that are formed naturally when nitrogen combines with oxygen or ozone. This interaction occurs naturally in water, soil, plants, and food. These contaminants are a commonly detected well water contaminant. Nitrogen is essential for all living things, but high levels of nitrate in drinking water can be dangerous to health, especially for infants and pregnant women.

Where and how does nitrate get into drinking water?
Nitrate can occur naturally in surface and groundwater at a level that does not generally cause health problems. High levels in well water often result from improper well construction, well location, overuse of chemical fertilizers, or improper disposal of human and animal waste. Sources of nitrate that can enter your well include fertilizers, septic system waste, livestock manure, and erosion of natural deposits. Wells may be more vulnerable to such contamination after flooding, especially if the well is shallow, hand dug or bored, or have been submerged by floodwater for long periods of time.

What are the health effects?
Ingestion of water containing high nitrate or nitrite concentrations can be fatal to infants. When ingested, nitrate is converted to nitrite by bacteria in saliva and in the digestive tract. In babies, this process can interfere with the ability of the child's blood to carry oxygen, which can lead to a blood disorder called methemoglobinemia or "blue baby syndrome." Symptoms include shortness of breath and blu-tinged skin. Water containing nitrate or nitrite should not be used to prepare food or formula for infants.
Nitrate and nitrite are rarely a problem for people older than six months. However, some individuals may be more susceptible to health problems due to certain health conditions, DEQ advises to consult with your physician if you are at risk or think you might be at risk for additional health effect information. REFER TO ASTDR.

Are nitrates or nitrites in my drinking water?
As the well owner, you are responsible for sampling and testing your drinking water. DEQ has compiled a list of laboratories in the state for your convenience.

How do I remove nitrate and nitrite from my drinking water?
Nitrate may be successfully removed from water using treatment processes such as ion exchange, distillation, and reverse osmosis. Heating or boiling your water will not remove nitrate, the nitrate levels in water can increase in concentration if the water is boiled due to evaporation during heating. Mechanical filters or chemical disinfection, such as chlorination, do not remove nitrate from water. Remember to have your well water tested regularly after installing a treatment system to make sure the problem is controlled.

Additional Resources
Agency for Toxic Substances & Disease Registry -Nitrate/Nitrite Toxicity
EPA Basic Information about Nitrate in Drinking Water